SCIENTIFIC ATTITUDE, COGNITIVE STYLES AND SPIRITUAL BELIEF AS PREDICTORS OF INTEGRATED DEVELOPMENT AMONG UNIVERSITY STUDENTS

A

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Supervisor
Dr. Lajwanti
Associate Professor

Researcher
Vikrant Bhaskar

Prof. Vibha Nigam
Dean & Head
Deptt. Of Pedagogical Sciences

Faculty of Education
Dayalbagh Educational Institute
(Deemed University), Dayalbagh, Agra

1.0.0. INTRODUCTION

Scientific attitudes can be regarded as a complex of values and norms which is held to be binding on the man of science. The norms are expressed in the forms of prescriptions, proscriptions, preferences and permissions. They are legitimatized in terms of institutional values (Barnes and Dolby, 1970). The current set of scientific attitudes of objectivity, open-mindedness, unbiassedness, curiosity, suspended judgement, critical mindedness, and rationality has evolved from a systematic identification of scientific norms and values. According to Paul G. Hewitt, The success of science has more to do with scientific attitude and this attitude is one of inquiry, experimentation and humility before the facts. This attitude is one of the key objectives of science teaching and it also one of the major outcomes. It makes the people live as efficient citizens in the present scientific society. Rao,(1990) found that the scientific attitude in secondary school pupil was average. There was no influence of sex on scientific attitude than their counterparts. Kumar, (1991) found that the scientific attitude test scores of boys and girls of the average group differed significantly. Nelliappan, (1992) found that there was a strong relationship between the high and low learning environment among the biology students of the higher secondary schools in their scientific attitude and scientific interests.

Bhaskara Rao (2004) stated that the most useful scientific attitudes are open mindedness, critical mindedness, respect for evidence, suspended judgment, intellectual honesty, willingness to change opinion, search for truth, curiosity, rational thinking, etc. Scientific attitude is really a composite of a number of mental habits, or tendencies to react consistently in certain ways to an innovative or problematic situation. These habits or tendencies include accuracy, intellectual honesty, open-mindedness, suspended judgment, critical mind, and a habit of looking for true cause and effect relationship. It is a cognitive concept; scientific attitudes are normally associated with the mental processes of scientists.

The way of thinking of an individual this makes him different from others. It called cognitive style. Cognitive style refers to an individual's way of perceiving and processing information. Field-dependence-independence is one dimension of cognitive style. Field

dependence and field independence respectively refer to a global in contrast to an analytical way of perceiving. Global versus analytical cognitive styles have been studied with respect to their differential influence on attitude development in ESS by (Walters and Sieben1974). From its introduction into the psychological literature by Gardner in 1953, the concept of cognitive style has been widely examined in terms of its relation to a variety of dimensions of academic success. The most widely examined aspect of cognitive style is field dependence independence. Field- independent, or analytical, individuals tend to perceive items as distinct from the backgrounds in which they may be embedded. Those individuals more apply categorized as field-dependent, or global, on the other hand, tend to view items within their particular embedded context (Witkin, Dyk, Faterson, et al., 1962).

The Walters and Sieben study (1974) looked specifically at science in comparing cognitive style with affective development using the National Science Foundation (NSF) curriculum, Elementary Science Study (ESS), as the designated program of study. Results indicate that success in developing scientific attitudes, as measured by the Science Attitude Inventory (SAI), is greater in field-independent or analytical subjects. This study also compared ESS-a process approach to science-to a textbook or product approach to science.

Along with scientific attitude and cognitive style spiritual belief is also a core of one's life which should be included for integrated development of human.Spiritual belief is a faith in divine power and to feel about it. Religion is a system of faith and worship and spirituality is to feel about it. It belief develops with consciousness. Spiritual health is a part of health i.e. totally comprised of the wellness; for this reason, spiritual health is believe as synonymous with spiritual wellness. Spiritual wellness is an ability of individual to establish a values method and act on the method of beliefs, as well as to establish and carry out evocative and constructive lifetime aims. From1990’s refer of spirituality has dramatically increased in prominence as an important area of research in various professions such as medicine, psychology, organizational behavior etc. The spiritual element tries to be in coherence with the world. Strives for answers about the endless, and comes into center when the person faces emotional stress, physical illness

or death. It is often based on a faith in a power greater than the individual that helps individual contribute to an improved excellence of life for all. An individual with spiritual wellness is generally considered as fulfilled as opposed to unfulfilled.Spirituality describes the personal and relational side of those beliefs, which shape daily life. So while one could be spiritual without being religious or vice versa, in practice the two are commonly intertwined as people experience and describe their spirituality through a religious perspective.

To bring integrated development of scientific attitude, cognitive styles and spiritual belief should be interlinked. Integrated development of personality is necessary for the progress of a nation. Integrated development is, after all, the natural state of life. If not all, almost everything is made in equal form. Take for an instance the ecological balance of water, fire and wind, which composes the elements of our earth. When one is imbalanced will surely create a catastrophe such as hurricane, wild fire and tornado. Balance is important in our life. However, most of the time, we only notice its importance when our life began to be off balance, such as when catastrophe happens or we feel loss and pain. Only then we become aware of our own negligence. Integrated Development composes of Four (4) Dimension;-

Physical – includes our physical body and health, Mental – includes our intelligence, mind set and growth as individual., Emotional – includes our feelings, maturity and relationships with other people., Spiritual – includes our faith, traditions, religions and belief.

To be able to live an integrated development the challenge for us is to visit and take part of each dimension in our day to day life. Integrated development does not have to mean a total equality of the four dimensions. It only requires us to spend time on each of the dimensions, in our day to day life, so as not to be abusive and over doing in only one area of our life. We were able to live in all the dimensions of our life; it will surely give us completeness to attest that we are indeed living a balanced life that is a life lived to its fullest.

Therefore on the basis of in the previous section the researcher will do this research on effect of scientific Attitude, cognitive styles and spiritual belief on integrated development of university

Students. They are part of integrated development and they should be developed in a person for welfare of society and educational as well.

1.1.0 EMERGENCE AND JUSTIFICATION OF PROBLEM

Integrated Development starts from and has been mostly discussed in applied psychological disciplines such as work or family psychology. Theories and approaches within social psychology (e.g., the Scarcity Hypothesis, Chapman, Ingersoll-Dayton, & Neal, 1994) and personality psychology (e.g., Personality Systems Interaction Theory, Kuhl, 2001; the Self-Concordance Model within Self-Determination Theory, Sheldon & Elliot, 1999) provide a useful framework to explain several findings of Integrated development research.

Many researchers have undertaken scientific attitude, cognitive styles, spiritual beliefs and integrated development as the main subject for their study. In this regard we can mention certain studies carried out by the several investigators. Researchers have examined the quality of life increases over changing development. Spiritual belief is important component which provides energy, happiness and mental peace in life. The main aspects namely meditation, thinking, praying, worshiping God, mental knitting, giving voice to God, hope, beliefs, forgiveness, social support etc..

Spirituality is receiving day by day great attention in the field of psychological researches related to Quality of Life (QOL), well-being, happiness, and stress and coping etc. There is a growing concern in the spiritual and religious scopes of life and their influence on how patients manage with the life intimidating illness. Spiritual belief and involvement is one of the coping strategy which influences on the specific, social and cultural context. It is one of the strongest predictor of happiness. As spiritual belief is positive component in life, it is vital to recognize the status of spiritual belief in one self.

These theories will be discussed latter by facing concrete research problems.

1) Is there any relationship among the cognitive style, scientific attitude, and spiritual belief to effect the integrated development?

2) How far these variable will be helpful making the integrated development.?
3) Does sex significantly influence the acquisition of cognitive style, scientific attitude, and spiritual belief on integrated development?

The meaningfulness of life, includes the sense of life, religion or life philosophy, values, self-realization, self-actualization, and self-fulfilment. According to Seiwert (2000, 2001), all these areas of life are closely related to each other. This means, that neglecting or inappropriately preferring one life area will have an impact on other areas. For example, spending too much time and energy for work could lead to health problems (e.g., somatic complains, infarct, sleeping disorders), conflicts in the family (e.g., with one's partner), and also to dissatisfaction and alienation (the work doesn't provide personal meaning any longer). The result, then, is the loss of energy and motivation for work, and less work effectiveness. On the other hand, spending too little time and energy for work usually leads to problems at the workplace and loss of employment which could also affect other life areas (e.g., stress, depression, existential problems, and family problems, less self-actualization). Thus, focusing on integrated development we will deal with four presented life areas that cover central domains in people's life. Based on Seiwert's theoretical approach, the balanced relationship among these life areas will be studied. As noted before, the term integrated development refers to how much time people spend on the most important life areas. We speak about balance when the person subjectively perceives his or her time spent in each of these life areas as appropriate. Thus, I operationalize integrated development as the degree to which a person is able to spend appropriate time on each of the most important life areas achievement, relationships, health and meaningfulness of life. Recent research supported the importance of the balance for human life. Failure to achieve the balance was found to be associated with a variety of serious negative consequences for both individuals and organizations. Most important personal and societal consequences of failing to balance life domains are:

- increased levels of stress and somatic complains (Burke, 1988; Chapman, Ingersoll-Dayton, & Neal, 1994; Googins, 1991)
- depression and lower mental health (Beatty, 1996; Googins, 1991; Grzywacz& Bass, 2003)
- greater likelihood to misuse alcohol (Frone, Russel, & Cooper, 1993; Grzywacz& Bass, 2003)
- less life satisfaction, well-being and overall decrease in the quality of life (Adams, King, & King, 1996; Arye, 1992; Fisher, 2002; Grant-Vallone& Donaldson, 2001; Greenhaus, Collins, & Shaw, 2003; Gröpel, 2004; Noor, 2004; Rice, Frone, &McFarlin, 1992)

Various researches has been conducted on science education by taking various Research work on scientific attitude, cognitive style, spiritual belief and integrated development has been done in different situation and researcher doing in different situation.

Table 1.1- Exhibiting variable wise Analysis of the selected studies in International and National Perspective

S.NO.	YEAR	RESEARCHER	RESEARCH PROBLEM	FINDING OF THE PROBLEM
1.	2014	John Kayode,Olasehinde Dr.,AdemolaRafiu Olatoye, Dr.	Scientific Attitude, Attitude to Science and Science Achievement of Senior Secondary School Students in Katsina State, Nigeria.	In conclusion the study reveals that scientific attitude and attitude to science do not significantly predict science achievement. Each of scientific attitude and attitude to science has positive but no significant relationship with science achievement.
2.	2013	Sekar P. Dr.	The Scientific Attitude and Reasoning Ability of Biology and Computer Group Students	The present study clearly highlights the results of this study and others it is recommended that the science teachers may

				incorporate the reasoning ability during the teaching of science to improve the attitude of the students towards science learning,
3.	2013	Jena Chandra Parkash Dr.	Cognitive Styles of Rural Senior Secondary School Students in Relation to their Gender and Stream	The findings of this study have shown that difference between male and female undergraduate students on systematic cognitive style as well as on intuitive cognitive style is found to be insignificant.
4.	2012	Sam William Bassey,GraceUmoren, L. A. Udida	Cognitive Styles, Secondary School Students' Attitude And Academic Performance In Chemistry In AkwaIbom State – Nigeria.	The findings of this study have shown that cognitive styles have significant influence on students' academic performance in chemistry. It has also spotlighted that students' academic performance in chemistry is a function of their attitude.
5.	2012	Olson H. Larson &David J Peter.	Spiritual Belief and Marriage: A National Survey Based on Enrich Couple.	The findings of this study have shown that significant difference found on every scale. i.e. High vs. low spiritual agreement were also strongly related to Enrich couple with significantly.
6.	2012	Markle Thomas D.	Does Education Cause Spiritual Belief Change?	The findings of this study have shown that Education appears to have a limited role in causing spiritual belief change. Rather than education, foundational changes in spirituality were reported to result from life events and experiences.
7.	2011	Patil Vijay Gouri Dr.	A Comparative Study of Scientific Attitude about secondary and Higher secondary level Students	Findings suggest there is no difference found in the Scientific Attitude between secondary level students and higher secondary level students.

8.	2011	Changju Shi	A Study of the Relationship between Cognitive Styles and Learning Strategies	The results of the relationship between cognitive styles and each of the six learning pairs were found to have significant.
9.	2011	Matuska Kathleen	Validity Evidence of a Model and Measure of Life Balance	This research supported the validity of the LBM and the LBI. Structural equation modeling showed that the best model is where congruence moderated by equivalence predicts lower stress and higher need satisfaction and personal well-being.
10.	2010	Jain Madhu, and Kumari Shilpa & Joshi Shobhna	Spiritual Belief and Its Relation to Psychological Well-being	The findings of this study have shown thatinvestigator found the constructive link between spiritual beliefs and psychological well-being.
11.	2005	Gropel Peter	On The Theory Of Life Balance: The Relation To Subjective Well-Being And The Role Of Self-Regulation.	The findings suggest were persons especially skilled in self-motivation and self-relaxation reported to high competence to choose and attain self-concordant goals and, as a result to balance their time spent across life domains more effectively.
12.	2005	Leipoldt A Erik.	Good Life In The Balance: A Cross-National Study Of Dutch And Australian Disability Perspectives On Euthanasia And Physician-Assisted Suicide.	The significance of this low cognitive dissonance in relation to the informants' views on EPAS was explained using the study's conceptual framework.

1.2.0. STATEMENT OF THE PROBLEM

In reference to the above justification the present problem can be stated as below-

Scientific Attitude, cognitive styles and Spiritual Belief as Predictors of Integrated Development among University Students

1.3.0. DEFINITION OF THE TERMS USED IN THE STUDY

1.3.1. Scientific Attitude

Scientific Attitude as the attitude of open rational mind, questioning, curious, critical mind a tomorrow's mind instead of yesterday's mind resistant to rigidity and resilient to change. (Nayudamma 1999).

Operational Definition

A Scientific Attitude as curiosity, open-mindedness, faith in scientific attitude method, cause and effect relationship, critical mindedness, seeks evidence, objectivity, suspended judgement, aversion to superstations.

1.3.2. Cognitive Styles

Cognitive styles are mode of behavior rather than a modifying process. It denotes consistencies in individual mode of functioning in variety of behavioral situations. (Coop and Sigel 1971).

Operational Definition

Cognitive style involves the ways of thinking, storing information, decision making and believing in interpersonal relationship. it includes of styles of cognition like systematic style, intuitive style, integrated style, undifferentiated and split style.

1.3.3. Spiritual Belief

Spiritual belief is an individual conviction that there is few unseen Higher Powers or Forces in the universe that affects life on Earth, including you and other people.

Operational Definition

Spiritual belief is a feature that goes beyond religious affiliation that tries for inspiration value, meaning and aim even in those who do not believe in any God.

1.3.4. Integrated Development

A satisfying pattern of daily activity that is healthful, meaningful, and sustainable to an individual within the context of his or her current life circumstances.(Matuska& Christiansen, 2008).

Operational Definition

Integrated Development refers to the all-round development of personality in which all its dimensions (cognitive, affective, psychomotor and spiritual) are developed in an integrated and holistic manner.

1.4.0. OBJECTIVES OF THE STUDY

1. To study the Scientific Attitude of university students with reference to gender and stream.
2. To study the Cognitive Styles of university students with reference to gender and stream.
3. To study the Spiritual Belief of university students with reference to gender and stream.
4. To study the relationship between Scientific Attitude and Integrated Development of university students.
5. To study the relationship between Cognitive Styles and Integrated Development of university students.
6. To study the relationship between Spiritual Belief and Integrated Development of university students.
7. To study the contributory role of Scientific Attitude, Cognitive Styles and Spiritual Belief in the Integrated Development of university students.

1.5.0 HYPOTHESES OF THE STUDY

In relation to the above mentioned objectives the hypotheses can be formulated as follows-

1. There will be no significant difference in the level of Scientific Attitude of male and female university students.
2. There will be no significant difference in the Cognitive Styles of male and female university students.

3. There will be no significant difference in the level of Spiritual Belief of male and female university students.
4. There will be no significant difference in the level of Scientific Attitude of university students of different streams.
5. There will be no significant difference in the Cognitive Styles of university students of different streams.
6. There will be no significant difference in the level of Spiritual Belief of university students of different streams.
7. There will be no significant relationship between Scientific Attitude and Integrated Development of university students.
8. There will be no significant relationship between Cognitive Styles and Integrated Development of university students.
9. There will be no significant relationship between Spiritual Belief and Integrated Development of university students.
10. There will be no significant contribution of Scientific Attitude, Cognitive Styles and Spiritual Belief in the Integrated Development of university students.

1.6.0 DELIMITATIONS OF THE STUDY

The present study will be delimited into the following-

1. The present study will be limited within the Agra and Aligarh regions only.
2. The present study will be limited to the male and female undergraduate students of two streams (Science and Arts) of Dayalbagh Educational Institute Agra and Aligarh Muslim University, Aligarh.

1.7.0 VARIABLES OF THE STUDY

Following variables have been taken up in the present study.

- **Independent Variables (**Predictor Variables): - Scientific Attitude, Cognitive Styles and Spiritual Belief.
- **Dependent Variables (**Criterion Variables): -Integrated Development.

1.8.0 METHOD FOR THE STUDY

Keeping the nature of the Problem in mind, the researcher will carry the present study on the lines of Correlational Method (Descriptive Survey Method).

Correlational Research Method a statistical measure of identifying relationship between two or more variables to give an indication of how one variable may predict another.

1.9.0. SAMPLE SELECTION

1.9.1 Population of the Study

Selection of the sample is an important aspect of research. The university students of Agra and Aligarh city will be considered as the population of the study.

1.9.2. Sample of the Study

The researcher will use purposive sampling to select the universities and Stratified Random Sampling for the selection of sampling units. Sample will consist of 1000 undergraduate students of both stream science and arts from Dayalbagh Educational Institute Agra, and Aligarh Muslim University, Aligarh.

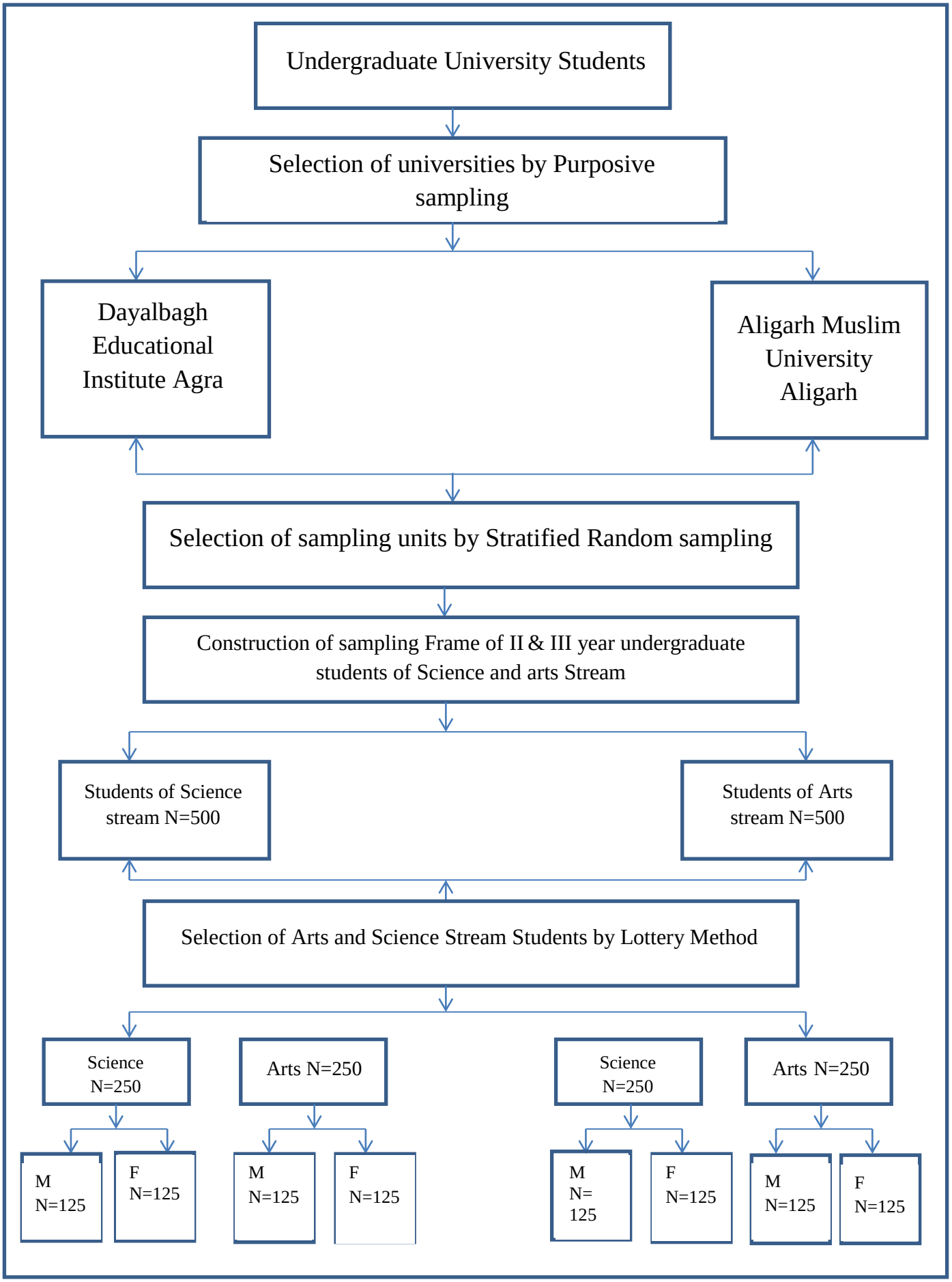
Undergraduate University Students
Selection of universities by Purposive sampling
Dayalbagh Educational Institute Agra
Aligarh Muslim University Aligarh
Selection of sampling units by Stratified Random sampling
Construction of sampling Frame of II & III year undergraduate students of Science and arts Stream
Students of Science stream N=500
Students of Arts stream N=500
Selection of Arts and Science Stream Students by Lottery Method
Science N=250
Arts N=250
Science N=250
Arts N=250
M N=125
F N=125
M N=125
F N=125
M N= 125
F N=125
M N=125
F N=125

Fig. 1.9.2: Exhibiting the sample Design

1.10.0. TOOLS FOR THE STUDY

The following tools will be used in the study-

1. Spiritual Belief Scale by H. Deshmukh and N. Deshmukh.
2. Cognitive Styles Inventory by Praveen Kumar Jha.
3. Scientific Attitude Scale by Awnish Grewal.
4. Integrated Development Tool-Self developed by Researcher

1.11.0. STATISTICAL TECHNIQUES

Descriptive and inferential statistical techniques will be used as required in the present study including:-

- Mean.
- Standard deviation.
- t-test.
- Product Moment correlation.
- Multiple correlations.
- Multiple Regressions Analysis.

1.12.0 SIGNIFICANCE OF THE STUDY

The consideration of cognitive styles and student scientific attitude are important criteria in the development and implementation of both curricula and instructional performance. This study would also help to provide some information for curriculum designers and classroom teachers in order to utilize relevant approaches to develop the integrated development of the students. Thus the knowledge of students cognitive style, attitude and spirituality would be very useful in both academic and career counselling.The teacher should not only emphasize only on intellectual development but on the all-round development of the students. Teacher can organize various social activities in order to develop social & democratic values. The opportunities should be given for self-expression in group situation. Teacher should help the students in the self-realization which would help the student in the increment of self-identity. Spiritual education should be provided by the teachers to the students.

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